National STEPS Network
Respirable Focus Group Minutes and Notes
June 26, 2012

Meeting Location:
Humble Civic Center – Humble, TX

Moderator:
Rick Ingram, S.G.E.
OSHA VPP Coordinator, T/A – BP North America Gas
Chairperson, National STEPS Network

Speakers:
Eric Esswein, NIOSH, Industrial Hygienist, eje1@cdc.gov
Tina Jones, Washington D.C. OSHA office, jones.tina@dol.gov
Sean Reiniger, Frac Sand Dust Control, sean.rhino@comcast.net
Mike Riggs, J&J Truck Bodies & Trailers, jjmdr@jjbodies.com
Travis Anderson, NOV-Appco, travis.anderson@nov.com
Eric Hoover, Excalibur, ehoover@excaliburmachine.com
Dean Wingo, OSHA, wingo.dean@dol.gov

Attendees:
See last pages of document

- Introductions made and meeting agenda covered by Rick; purpose/goals of focus group discussed; Purpose is to protect workers, so how can we best do that…what makes sense and what will work?
- Focus group attendees announce position and company

Review of the NIOSH Fact Sheet – Eric Esswein

Eric asked about awareness of the NIOSH Fact Sheet entitled NIOSH Field Effort to Assess Risks for Chemical Exposures in Oil and Gas Workers and explained why NIOSH partnered with the oil/gas industry to do the study; there's currently not a lot of chemical exposure risk information on the upstream side, specifically for drilling and fracking that if there are (or not) exposure risks; plenty of information for downstream. NIOSH is a research agency in a position to say, "Where are the needs and how to we get to them?" One way this is done through National Occupational Research Agenda (NORA); one goal is to create partnerships between industry and government to do industrial hygiene work and see if there are risks out there.

During summer 2008, Eric visited a frac site and saw this "vapor" coming out of the sand mover only to be told it was dirt. From an exposure characterization perspective, everyone was saying you need to look at frac fluids, but from everything he's seen, frac fluids are typically l contained in totes or reserve pits when it comes out of the well during flowback and there isn't that many workers working around frac fluids or having obvious risks for exposures Silica dust in the air is different. Silica is one of the oldest known occupational hazards in the world and silicosis is probably the oldest known pulmonary disease; Greeks and Romans knew when people went into mines, they came out with incapacitating

diseases that often killed people. If you will, silica would be called a "low-hanging fruit" and Eric felt it was a good place to start for exposure characterizations.

Research and sampling started in the summer of 2008, by taking area samples. In those area samples, it looked like there was a potential for personal exposures; area sample are not reflective of personal breathing zone exposures, you can't determine the magnitude of the exposures or the risk. More focused research started mid-summer 2010 and continued through fall 2011; samples collected from sites in five states and 11 different sites and collected a variety of different samples (both area and personal breathing zone) to determine the exposure to respirable dust exposure and not just respirable silica. Sampling for respirable dust is straightforward; size-selective sampler are used, a "cyclone," is needed and take a full shift sample from the worker and analyze is for two things: weight (gravimetric) for the presence of respirable dust on the filter and then have it analyzed for silica. You can use those numbers and calculate percentage of respirable silica, and from there calculate the OSHA PEL which is a formula; 10 mg/cubic meter divided by the quantity (% silica plus two)…if it's confusing to you, it's also been confusing to industrial hygienists. It derives from the OSHA PEL for respirable dust, which is five milligrams per cubic meter so if no silica, the PEL is 5 mg/m3.

2011 was dedicated to field studies, visiting various active fracking sites with geographic, seasonal (testing in all four seasons) and topographic diversity, along with differences in elevation; ranging from 300ft-400ft in Arkansas to 4,700ft in the DJ Basin.
We wanted to make sure we weren't cherry-picking a particular season, for example times when there was a lot of wind or times when there wasn't a lot of wind. Also, to look to see if there were differences in locations where different types of sands being used, for example the Marcellus compared to the Bakken compared to the Eagle Ford.

The main idea was to make sure the exposure assessment work we did was representative. As we did the exposure assessments it appeared that there were overexposures to respirable dust containing silica at each of the basins we worked at. Of over the 100 samples taken, about 47% exceeded the calculated OSHA PEL and a little less than 80% exceeded the NIOSH REL (which is a fixed number); NIOSH recommended exposure limit is 0.05 mg/cubic meter as a time-weighted average, it's not an enforceable occupational exposure criteria; To put things in perspective the NIOSH REL for lead (Pb) is the exact same as the NIOSH silica REL 0.05 mg/m3 as a TWA. .

Sampling Strategy: Anyone who participated in the Field Effort was a volunteer; our exposure assessment goal was to sample workers who worked closest to the source of sand including sand movers and blenders and those who were further away from these operations. . Fifteen (15) different job titles were included, including sand mover operators, blender operators, hydration unit operators, t-belt operators, a wireline crew worker, along with workers not in the immediate area of sand moving, these workers are sand coordinators, also called swampers who ground guide trucks on site and typically are not right in the immediate area where sand dust is generated from machinery like sand movers. . We did see differences in exposures there.

Take-Away Points: If you observe fracking operations, you can notice there really aren't any engineering controls for sand. The differences you see are in controls for safety vs. health (i.e.- when workers go up on a sand master, there are rails built in for fall protection or if you are wearing fall protection, there is a big wire that goes across the top of it). But there are no dedicated controls for sand dust, whether moving it on the dragon tail or in the blender tub and particularly when refilling sand movers, which typically involves hundreds of thousands of pounds of sand being moved per zone everyday. In the work we did we noticed that typically two to three zones were being completed every

day. At some sites in spring 2011, workers did one zone per well, two of these each day which were refracks. A little more than 30% of the samples results were more than 10 times the NIOSH REL. This was one of our concerns because most of the workers, not all, wore respirators (either half-mask, air-purifying respirator or filtering face piece respirator), which has a NIOSH-approved protection factor of 10 which is designed to provide protection up to 10 times the occupational exposure limit and if you exceed that workers are not getting the respiratory protection intended by that class of respirator.

Our observations include that Dust is generated from operations on site primarily from seven different point sources areas:
1. Expelled out of thief hatches on tops of sand movers during reloading
2. from the rotating belt (either caused by vibration itself or wind blowing across the sand belt) under sand mover)
3. at the end of Dragon Tail (as the belt turns the corner and drop sand into blender tub)
4. at the blender tub from agitation
5. From T-Belts (when using T-belts as an intermediate transfer operation)
6. Out of fill ports on sides of sand movers with no cam-lock caps installed
7. from vehicle traffic on site, and there are dust control options for this source.

Concerns: At many of the sites workers wearing respirators had facial hair; if you have an effective respiratory program that meets the criteria of OSHA, workers should be trained to know and recognize that facial hair gets in the way of the seal of the respirator.

Question: When talking to these workers, did you find any of them to be familiar with the hazards of silica? Leslie McGaha, EP Energy

Answer: Some of the workers were and there are a couple ways you can gauge that and it's the questions they ask you. Workers always seem to ask us "are we all going to die?" My answer is yes, because everyone is going to die. Are you going to die today? No. Are you going to die from what is out here today? Probably not. Point of this discussion is that it is a good transition into the discussion of "how well do you think you are protected today?" That gets to the beating heart of an effective HAZCOM program. If workers don't understand the occupational health risks of quartz (silica) exposure, they likely don't have adequate HAZCOM training.

Workers need to have an understanding that silica is quartz; we're talking about the same thing. I believe many workers understand the degree of the hazard, but there are others who don't. When talking about something that has an occupational exposure limit of 0.05 mg/m3 it's a really small amount of dust over a full shift, it's really easy to not understand with the of the exposure hazard when you are using hundreds of thousands of pounds of sand every day

Question: Is it only a respiratory hazard if ingested?

Answer: Silica is an inhalation hazard, but it can affect other organs inside the body other than the lungs.

Question: Where did the 0.05 value come from?

Answer: Based on the analytical limited of detection when the REL came out. Now even at 0.05 mg/m3, recent studies have shown that if workers are exposed to that over a 40-year working lifetime, silicosis can occur. There are case histories of this looking at gold miners in South Africa and in Colorado.

You may be wondering how much silica did we see in the samples we collected. I'd say that based on an average the respirable dust samples contained 30-60% so average about 50%, some samples were non-detectible and a couple were 100% silica.

Question: When some workers get off the shift (we call them" ghost workers") they are covered in dust at the end of the stage. That's also an inhalation hazard, isn't it?

Answer: Yes removing clothing that is contaminated with silica dust could be an exposure hazard from re-suspension of the dust. NIOSH has developed a control for this, it's a clothes cleaning booth that uses jets of compressed air to remove dust from clothing; it was developed for miners…our mining engineers have developed this because they we seeing the exact same thing. The booth is configured with a series of air jets designed to clean the uniform as it pulses air removing the dust; ear protection and a respirator are required.

We sampled from the time the work began to when shift was over, most shifts were a 12-hour. Did we adjust the exposures for a 12-hour shift? No, we did not. You can appreciate what the numbers would look like it we had; they would look worse. We did not do this because we were not doing compliance sampling; our work was research oriented, so we didn't do that. If you did the math and used something like the Brief and Scala model and adjusted for a 12-hour shift, sampling results would be higher, they would actually be higher than what we reported.

Question: Sand coordinators having a degree of exposure, how much of it do you think is soil pad materials vs. spilled sand?

Answer: For sand coordinators upwind of the sand moving operation, I think most of it is from vehicle traffic. At several site we looked at exposures to sand coordinators who were upwind of where the frac was occurring. We knew which way the wind was blowing and we knew which way the sand movers and blenders were and knew which way the trucks were coming. Wind can generate dust, but I think a lot of it is from truck traffic, from the impaction of wheels on ground itself and in some cases when air brakes are released. There are controls available: use chloride-amended water, an agent designed to prevent the roads becoming dusty.

Question: Any background/baseline sampling when there was not sand transfer taking place to determine whether truck traffic was stirring up the silica?

Answer: We did not.

Question: Have you done any estimates of the exposed population? How many people are affected?

Answer: Don't know the answer to that. Estimates are about 435,000 workers in upstream E&P alone, a little less than half of those folks work on completions work.

Question: Typically what was the number of crew there?

Answer: Anywhere from 10-12; which included blender operators, sand mover operators, chem truck operators, hydration unit operators, wireline crews, sand coordinators, supervisors. The exact number will likely vary depending if there are more or less machines out there.

Question: Any other hazards associated with any other proppant materials?

Answer: In one location 62% of the proppant was Black Cat (ceramic product). Black cat is a synthetic proppant which does not contain silica. A portion of the frac was black cat, MSDS said it contained less than 1% silica and on that particular site, there were no exposures that exceeded the OSHA PEL.

Substitution works, but it doesn't work for everyone; black cat is more expensive. Our study couldn't determine the difference because we didn't know if they were running in 100 meshes. The workers knew that 100 mesh is a lot dustier.

Question: One of our clients uses Dust Net…do you have any info on that?

Answer: No, I do not.

There were some resin-coated proppants being used, required for higher downhole pressures. If you are going to control dust in general, you are going to control resin-coated sand.

A participant noted that there are ceramic proppants out there that are not silica-free. They are out there and be careful of them. From the perspective of supply and demand, mandating the use of only ceramic proppants could shut down the US fracking industry, as well as not being technically appropriate.

Question: Leslie McGaha, EP Energy: Were the results what you anticipated?

Answer: You can't anticipate them. We really had no idea what the exposures might be as we had not done personal breathing zone exposure assessment work on hydraulic fracking sites before, and there's nothing in the literature to indicate the range of typical workplace exposures. .

Question: Made a comment about topography, elevation, weather. Were you looking at different service companies?

Answer: Yes, we worked with different service companies. We wanted to look at sites with different topography because Western CO (for example doing work in canyons; morning up-canyon wind, afternoon down-canyon wind; some days no wind) is very different from the plains of North Dakota or the forested hills of Pennsylvania. We wanted to try to get a variety of locations and topography in the mix; while we didn't work in a box canyon, but did work where canyon walls were on both sides and we worked on the open plains. We wanted to make sure the exposure assessments were representative of a variety of work locations. . We were trying to get a study as representativeness as possible.

Question: Is there a report out here that is available?

Answer: Working on it now.

Question: Can you give us an update on the NIOSH mini bag house retrofit?

Answer: We did a proof of concept evaluation last week in CO, this is a relatively simple "bolt on control" we are also looking at a more advanced engineering control for one point of dust release, that is to replace sand transfer belt with a screw auger to move sand. The easier one is the NIOSH mini-bag house retro-fit; it involves a transition flange (square to round) that is fitted over the thief hatch opening, the transition flange goes to a mini bag house (about 7ft tall), a gallows attachment holds the bag up when not inflated. The idea is that this control is designed to be self-cleaning. When end of fill cycle is over, operator of sand truck gooses the compressor and inflates the bag to expand it tightly, then reduces air to let the bag collapse. We need industry help with further testing to see how many cycles we can run it through before bag blinding occurs. Had a couple of leaks where there were some welds that weren't completely done; this is only the first version but it appears to be an effective point source control. Air compressor delivers the proppant; bag house is completely passive; takes advantage of pressurization during filling.

Break at 10:13 a.m.; Meeting resumed at 10:23 a.m.

OSHA/NIOSH Hazard Alert on Worker Exposure to Silica during Hydraulic Fracturing - Tina Jones

The OSHA/NIOSH Hazard Alert focuses on silica exposure and was created to raise awareness about hazards and controls. The alert was developed at a very fast-pace in coordination with industry and labor.

Timeline:

April 30, 2012- NIOSH silica exposure data presented at Institute of Medicine meeting
May 2012- OSHA and NIOSH initiate work on joint hazard alert
June 2012- OSHA and NIOSH coordinate with industry (STEPS) and labor on hazard alert
June 21, 2012- Hazard Alert published to website

Summary of NIOSH Data:

NIOSH Findings on Worker Exposures to Silica

In cooperation with oil and gas industry partners, NIOSH collected 116 full shift air samples at 11 hydraulic fracturing sites in five states (Arkansas, Colorado, North Dakota, Pennsylvania, and Texas) to determine the levels of worker exposure to silica at various jobs at the worksites. Many air samples showed silica levels for workers in and around the dust generation points above defined occupational exposure limits.[i]

Of the 116 samples collected:

- 47% showed silica exposures **greater than** the calculated OSHA PEL.
- 79% showed silica exposures **greater than** the NIOSH REL of 0.05 milligrams per cubic meter (mg/m3).
- 9% of **all** samples showed silica exposures 10 or more times the PEL, with one sample more than 25 times the PEL.
- 31% of **all** samples showed silica exposures 10 or more times the REL, with one sample more than 100 times the REL.

Immediate and Long-term Actions with applicable OSHA Requirements:

What can be done at hydraulic fracturing worksites to protect workers from exposure to silica?

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthy working conditions for their workers. Employers must determine which jobs expose workers to silica and take actions to control overexposures and protect workers. A combination of engineering controls, work practice, protective equipment, and product substitution where feasible, along with worker training, is needed to protect workers who are exposed to silica during hydraulic fracturing operations.

One way to reduce silica exposures is to use alternative proppants (e.g., sintered bauxite, ceramics, resin-coated sand) where feasible. However, before using other proppants, it is important to evaluate the health hazards associated with them. If safe proppant alternatives are not feasible, then employers should monitor worker exposures, take measures to prevent exposures to silica, and inform workers of hazards, as described below.

Several OSHA standards and directives cover operations that may expose workers to silica, including:

- Air Contaminants (29 CFR 1910.1000)
- Hazard Communication (29 CFR 1910.1200)
- Respiratory Protection (29 CFR 1910.134)

OSHA's Directive CPL 03-00-007, titled *National Emphasis Program – Crystalline Silica,* has detailed information on silica hazards, guidelines for air sampling, guidance on calculating PELs for dust containing silica, and other compliance information.

Monitor the air to determine worker exposures to silica

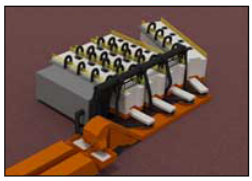
- Collect **respirable dust** samples to determine which jobs expose workers to silica above exposure limits. Employers should consult with a trained occupational safety and health professional, such as a certified industrial hygienist, or contact OSHA's free on-site consultation service.
- If air samples show levels above OSHA's calculated PEL, employers are required to take actions to reduce worker exposures. However, both OSHA and NIOSH recommend that employers take the actions below to keep worker exposures below the NIOSH REL.

Control dust exposures by improving existing engineering controls and safe work practices

Engineering controls and work practices provide the best protection for workers and must be implemented first, before respiratory protection is used. Working with industry partners, NIOSH has identified the following control options for hydraulic fracturing operations:

Short-term work practice and procedural changes that can be implemented quickly:

- **Mandate the capping of unused fill ports (e.g., cam lock caps) on sand movers.** Securing unused fill ports can help reduce the dust released, especially during filling.
- **Reduce the drop height between the sand transfer belt and T-belts and blender hoppers.** Limiting the distance that sand falls through the air can help reduce dust.



A conceptual example of dust control technologies being used by industy. Photo credit: Frac Sand Dust Control LLC

How Employers Can Get Assistance from OSHA & NIOSH:

How Can OSHA and NIOSH Help?

OSHA has compliance assistance specialists throughout the nation who can provide information to employers and workers about OSHA standards, short educational programs on specific hazards or OSHA rights and responsibilities, and information on additional compliance assistance resources. Contact your local OSHA office for more information.

OSHA's On-Site Consultation Program offers free and confidential advice for small businesses with fewer than 250 employees at a site (and no more than 500 employees nationwide) to help identify and correct hazards at your worksite. On-site consultation services are separate from enforcement and do not result in penalties or citations. To locate the OSHA Consultation Office nearest you, visit OSHA's website or call 1-800-321-OSHA (6742).

OSHA's Cooperative Initiatives: OSHA, NIOSH, and several U.S. onshore exploration and production industry trade associations, companies, and individual experts have formed a Respirable Silica Focus Group to further explore silica exposure during hydraulic fracturing and to develop practical short- and long-term solutions to protect worker safety and health

NIOSH is designing conceptual engineering controls to minimize exposure to silica during hydraulic fracturing. NIOSH is looking for industry partners to help test these engineering controls. If you are interested, please contact NIOSH at westernstatesoffice@cdc.gov. NIOSH is also looking for additional partners in drilling and well servicing to help evaluate worker exposures to chemical hazards and develop controls as needed. Please refer to the document NIOSH Field Effort to Assess Chemical Exposure Risks to Gas and Oil Workers for details and contact us if you have questions or wish to participate. In addition, NIOSH has an active program that encourages Prevention through Design considerations so that occupational health and safety aspects (such as dust control) are built into equipment during the design phase.

Employers and workers can always request a NIOSH Health Hazard Evaluation. For more information about this program, please visit the website.

NIOSH recommendations for preventing silicosis, including dust control, sampling and analysis methods, medical monitoring of workers, training, and respiratory protection, can be found at the Silica Topics webpage.

For more information, see Best Practices for Dust Control in Metal/Nonmetal Mining, which discusses dust control in underground mining operations. Research results from this document have direct relevance for minerals handling operations in hydraulic fracturing operations.

What's Next?

- Smaller employers need this information – how do we get this to them?
- We are developing additional resources for our staff and the public:
  - Technical briefing
  - Updates to the Oil and Gas e-Tool
  - Updates to the Oil and Gas S&HTP
  - Checklist (suggested)
  - 2-pager/tool-box-talk on Silica (suggested)

2012 OSHA Oil & Gas Conference – www.oshasafetyconference.org

Frac Sand Dust Control – Sean Reininger

History- Contacted by pressure pumping company a couple years ago. Issues saw: noticed workers and capital equipment (plugged air filters, alternators), uncomfortable work environment it creates.

System developed eliminates the dust; use very small footprint; dust collector (gray unit on left), only need a 12' by 30' area, all duct work is overhead, so no tripping hazards. Initially all duct work was on group and later became elevated; vacuum airflow goes into the hopper; versatile system; vacuum unit connected and running.

Four sand trailers; ask Sean to send detailed illustration of arrows indicate vacuum airflow slide; filters down to .5 microns (.5 to 5 microns is the size of a particle of cigarette smoke)

Do they use a water spray to keep dust down? No. Looked at a lot of different methods to keep dust down. Came up with this method because a vacuum (45,000 cfm's), you don't need caps on field pipes, address cracks on trailers; spillage is a big issue. With a bag house, it's hard to see inside because people are counting the sand as the frac is going on.

What is the setup time if you had three sand kings? 3 kings, 4-5 hours; 4 kings, 6-8 hours. Need a crane to setup.

Have you done an analysis of the particle size and distribution for the airborne dust collected? Yes. If the dust that is collected has the same particle sizing and distribution as the parent material, why are you collecting it? Why not just feed it back into the process? First few sites they've been on, DEP in PA said to bury it, as long as it's not in the dust form. Later sites put in dumpsters, bag and all, and hauled it off.

Proppants less than 8% grade, you are pulling the fines out with the dust collection of grade material. That's what is airborne first and sucked out first. Suggestion testing what it collected. If you get sand up to top of thief hatch, you will suck sand. Make it into a semi-closed loop system.

Question: Did you take any air monitoring?
Answer: No, not yet. Working with NIOSH to do quality monitoring.

Question: Have you discussed how you would do that monitoring?
Answer: Same study NIOSH did with the system on. Need baseline data to compare against.

If you are vacuuming more than what is being put out, you should be getting it all.

Tim Hicks- Did some preliminary testing and found that there were still enough where appropriate respiratory protection was necessary

Once dust is collected, thousands of pounds per stage, all this dust is in a super-sac, is there potential risk for exposure in handling that dust? If you drop a bag and it spills, yes. How much will a super-sac filter if it's agitated?

Question: Is your system sold to fracking companies or is it a service?
Answer: Geared toward service. Cost? Deal with customer on per job basis.

Question: How many units?
Answer: 2 in the field, 1 in production

1. Dust from thief hatches on sand trailer (video)
2. Dust generated at fill ports on sand trailer
    a. Capping it sends it somewhere else; vacuum has enough cfm's to leave caps off and no dust will escape
3. Dust released from belt under sand trailers
    a. Possibility of putting a curtain
    b. Seen any issues of not being able to see the sand?
4. Dust as sand drops into blender hopper (video)
5. Dust as sand drops onto T-belt
6. Dust between T-belt and blender

a. Is that a shroud? 18" inch hole where sand falls through, perforations as sand falls, dust comes up and gets sucked into vacuum
b. South Texas alone there is 150 frac crews; 700-1,000 crews in the US

7. Traffic on location

10 to 80 stages or more?

Question: How much silica dust is collected per stage?
Answer: On average, 600-1,000 lbs.

Question: How many people operate the system?
Answer: 2 people working 12-hour shifts

Mike Riggs- Riggs Industries, J&J Truck Bodies and Trailers

Integrating both systems into the frac sanders

J&J Dyna-Sander
Central manifold built right into the movers; 45,000 cfm vacuum and filter system; auxiliary port for blender collection, t-belt duster collection, auxiliary port for t-belt cross over (request this slide)

Industry Options
Acquire new Dyna-Sanders with dust control technology
Retro-fit existing sanders with dust control technology
Subcontract dust control services

With control what hasn't been discussed is repair; silica is a known abrasive.

www.jjbodies.com, located in Somerset, PA

Question: Have you worked with any companies pulling off finds in conductivity, you might get dual-improvement?
Answer: A lot will come back up anyway as opposed of putting it back into the wellbore.

NOV-Appco, Travis Anderson

About a year ago, started development of a dust collection system; result is a rear-mounted system DCS580-Quad Dust Collection System.

Typical frac sander divided into four bins; t-belt/multi-sander, common conveyor

Mounts to rear of unit to allow dust to go between all different bins to get to the dust collector; air lock valve mounted to bottom, 20 in each dust collector, polyester-pleated cartridges

No silver bullet on what to do with the dust once it is collected.

System will take care of dusting during the fill, but doesn't address the other points of dusting during operation

Which 3200 cfm, can you open the hatch? You can open the hatch, but there is a seal around thief hatch, it is weight and it will burp. 800-1,000 cfm for each pneumatic hauler.

Resin coated sand, is there a potential for cross-contamination? Yes and no. Fills to a level and won't spill in; when frac sanders get filled, they will not go into that area. Potential is small.

Power supply? All self-contained. Set up as normal frac sander, valve in back turns the blower fan on and draws the air in; when complete, blower gets turned off…no additional set up involved.

On blower, is it off pony motor or hydraulic system? Engine has to run for it to be running…all part of hydraulics on system. Can retro onto existing frac sanders….easy retro fit by cutting passage way between top of bins and a hole in the back of the frac sander.

Pulse to clean bags? Compressor mounted to the engine, tie into existing hydraulic system and tie into the rail.

What do you think service life is for 20-pleated cartridge? Cartridges will last two years in industrial environment; recommend changing out after a year.

Excalibur Machine, Eric Hoover

Asked to look at range and recs, 9-10 months ago, frac tank issues of water hauling, water moving and how it ties in. Spent time in field research and see what they could do to enhance the product.

Confined space cleaning of the frac tanks; dust inside the tanks of the residue that is left is creating silica dust, but other particulates as well, on top of being in confined space. Worked with coming up a collapsible frac tank; bladder can be collapsed and disposed of; remains on fluid side can be eliminated. Confined space for welding, panelizing the tanks eliminates a safety hazard by building in panels; eliminates hazards in the shop in manufacturing and on site.

Last bag house got shipped into KY for a power generation plant, for safety and emissions control. Study on chipping on inside of frac tanks? NIOSH, no…not even aware if it's an issue. NIOSH hasn't worked on that side.

Break-out Sessions

Short-Term Fixes
Facilitator: Leslie McGaha, EP Energy

Five Things to Do Tomorrow

1. Toolbox talk- educate
    a. No formal OSHA/NIOSH toolbox item; utilize silica handout
2. JSA
    a. Include silica in JSA's tomorrow
3. Limit personnel
    a. In areas that have overexposure
4. Schedule IH monitoring
5. MSDS's for proppants; ease of availability
6. Shower/change area

Immediate

1. Check/audit respiratory program
2. Shave
3. Implement work rest/task rotations
4. Engage leadership
5. Audit housekeeping
6. Post-hazard alert in multiple languages (Spanish, Vietnamese, etc., with pictures)
7. Plan dust control (put up windsocks, teach people to stay up wind)
    a. Evaluate site layout
8. Blog subscription
9. Evaluate current procedures
10. Plan subcontractor communication (bridge documents)
11. Confined space training
    a. Cross-training employees
12. Label areas
13. Camera controls

Exposure Monitoring;
Facilitator: May Chau, BP; Conclusions presented by Wayne Skocypec, Baker Hughes

A. Exposure Monitoring Methodology
B. Exposure Monitoring Data Elements
C. Monitoring Strategy
D. What do you do with the exposure monitoring data?

1. Need identification by OSHA of exposure monitoring methodologies that are legally acceptable for determining PEL compliance, e.g., BG BK2.69 respirable sampler
2. Identify common data elements need to be collected when exposure monitoring is being performed, e.g., methodology, job task, percent of silica in the proppant, work activity, operational conditions, exposure controls in place, meteorological conditions, etc.
    a. Form a standardized exposure monitoring field collection work sheet.
3. Monitoring Strategy
    a. Next meeting via teleconference
4. Repository
    a. Use API, AIHA Oil & Gas Group, or?
    b. Aggregate exposure monitoring data, without company identifiers, through legal counsel to enable profiling of exposure levels by job function, operating conditions (mass and type of proppant, etc.), controls in place, meteorological conditions,

Engineering Controls
Facilitator: Travis Anderson, NOV Appco

1. Need standard methodology
    a. Data collection
        i. Set fixed number of people in certain number of responsibility over a three day period; take a worst case scenario to test and do that until a standardize method comes out of it
        ii. Possible lab test?

1. How do you do that properly in a lab though?

2. Misting
    a. Engineering controls
        i. Monitor and test system according to methodology and see how close we are to that standard
3. What level to target? .05 level?
4. Substitutions
    a. Not substitutions, but quality of the sand; apply controls there to help eliminate a lot of the dust occurring in sand itself
5. Partnering with service companies
    a. Test and evaluation and working together to develop criteria

Is focus on frac sanding alone? Or are we going to focus on frac sanding for now or are we going to expand out to brine and brine burn or are we? Issue right now will be respirable silica during frac and then expand out. As we go through this one issue, other opportunities will be identified.

Groups will meet via phone conference and big group will meet again in August.

OSHA Voluntary Compliance, Dean Wingo

Hazard Alert; what is OSHA's next step? Need to work with NIOSH to identify and figure out how to enforce the alert.

OSHA's multi-employer citation policy

Controlling employer (you brought everyone here)
Creating employer (you brought hazard)
Correcting employer (has responsibility to correct)
Exposing employer (your employees are exposed)

Voluntary Compliance Partnership

- Producer voluntarily assumes responsibility for fracking sites
- Producer agrees to implement (within next 30 days) quick fix corrections (silica)
- Producer agrees to evaluate fracking operations, develop a corrective action plan that include engineering controls to address any identified silica hazards
- Corrective action plan submitted in 45 days to area OSHA office
- OSHA agree for companies choosing voluntary compliance partnership not to conduct programmed inspection until action completed
- Companies choosing the voluntary compliance partnership will receive priority for OSHA technical assistance
- Companies participating and successfully complete partnership, will receive OSHA recognition, title TBD

VPP has same concept as OSHA compliance partnership. Don't have to do it today, wingo.dean@dol.gov, for questions, comments, and concerns.

Question: Program available on national level or particular region to start?
Answer: Region 6 without any reservation; if not in this region and your interested, can contact respective region and work together on it.

OSHA and producers need to share the same goal!

National STEPS Network
Respirable Focus Group Minutes and Notes
June 26, 2012

Attendees

1. Holly Hopkins, API
2. Pete Sandel, Aztec
3. Ronnie Hughes, Baker Hughes, Director of Pressure Pumping Engineering
4. Wayne Skocypec, HSE Director, Health, Baker Hughes
5. Tim Dame, Basic Energy Services, VP of US Pumping
6. Mickey Nevill, Safety Manager, Basic Energy Services, Pumping

7. Trampas Poldrack, Basic Energy
8. May Chau, Industrial Hygienist, BP
9. Rick Ingram, BP OSHA VPP SGE
10. Valerie Murray, BP Industrial Hygienist
11. David Nixon, BP HSE Advisor
12. Marcelo Panelo, BP, Regulatory Protection
13. Rod Kuntz, Calfrac
14. Brian Boerner, Chesapeake Energy, Manager Regulatory Affairs- Southern Division
15. Jim Chatham, Chesapeake Energy
16. Tom Flick, Chesapeake, Corporate Safety & Health Group
17. Johnna Miller, HSE Gulf Coast Operations, ConocoPhillips
18. Zack Laird, Continental Resources
19. Jeremy Patman, Devon Energy
20. Tim Hicks, US Lead, Occupational Health-Industrial Hygiene, Encana Oil & Gas
21. Darryl Burger, EOG Resources, Safety Manager
22. Leslie McGaha, EP Energy
23. Joe Greco, Excalibur Machine & Buckeye STEPS
24. Eric Hoover, President, Excalibur Machine
25. Kevin Keisel, Excalibur Machine
26. Len Kensey, Frac Sand Dust Control
27. Dustin Mitchell, Frac Dust Control
28. Sean Reininger, Frac Sand Dust Control
29. Scott Stutzman, Frac Sand Dust Control
30. Dan Perry, FTSI IH Safety
31. James Senger, Director of Corporate HSE, FTSI
32. Cliff Salawage, Global HSE, Halliburton
33. Mike Riggs, J&J Truck Bodies and Trailers
34. Ken Houston, VP HSSE, Key Energy Services
35. Danielle Kruger, Attorney, Key Energy Services
36. Mike Depuis, Marathon Oil, Corporate Industrial Safety
37. Christopher Hicks, Marathon Oil
38. Geoff Pettinger, HSE Manager, Microseismic
39. Robert Graham, Nabors Completions, US Production Services
40. Wayne Howard, Nabors Well Services
41. Eric Esswein, NIOSH, Industrial Hygienist
42. Ryan Hill, NIOSH Oil/Gas Safety Health Program, Co-Chair NORA Oil/Gas Council
43. Travis Anderson, NOV-Appco, Director of Engineering
44. Marcel Boucher, NOV
45. Amy Uttecht, NOV
46. Jonathan Bearr, OSHA
47. Tina Jones, OSHA
48. Todd Jordan, OSHA
49. Marianne McGee, OSHA Compliance Assistance, Corpus Christi
50. Jim Shelton, OSHA, Compliance Assistance, Houston North
51. Dean Wingo, OSHA Asst. Regional Administrator Region 6
52. Elizabeth Haley, Petroleum Education Council
53. Alan Smith, Pioneer Natural Resources, Safety Director
54. Kyle Zemlak, President, Pioneer Natural Resource Pumping Division
55. Craig Brown, QEP Resources

56. Mindy Stephens, Ringer Gloves
57. Mike McNeil, Sanjel, HSE Manager US Operations
58. Clint Windom, Sanjel
59. Ron Holt, Schlumberger, QHSE Manager N.A. Pumping
60. Bob Ryan, Deputy General Counsel, Stallion Oilfield Services
61. Vernon Rinehardt, Stewart and Stevenson
62. Ed Valicek, Stewart and Stevenson
63. Bob Ballard, Superior Energy Services, HSE Director
64. Roosevelt Smith, TETRA Technologies and Chairperson, SafeLand
65. John Baker, Industrial Hygienist, Total Safety, HS Services
66. Chuck Dingman, Industrial Hygienist, Total Safety EHS
67. Jimmy Brennan, President, Tucker Energy Services
68. John Crump, Tucker Energy Services, QHSE Manager
69. David Pickard, HSE Manager, XTO Energy
70. Gary Reznecik, Houston STEPS
71. John Stephens, Houston STEPS

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